CLAIMS

1. A carbon-containing aluminum nitride sintered body comprising: carbon whose peak cannot be detected on its X-ray diffraction chart or whose peak is below its detection limit thereon; in a matrix made of aluminum nitride.

2. The carbon-containing aluminum nitride sintered body according to claim 1,

wherein: said carbon whose peak cannot be detected on its X-ray diffraction chart or whose peak is below its detection limit thereon, is at least one of amorphous carbon, and carbon forming solid solution in the phase of aluminum nitride crystal.

3. The carbon-containing aluminum nitride sintered body according to claim 1 or 2,

wherein the content of said carbon is from 200 to 5000 ppm.

4. A carbon-containing aluminum nitride sintered body comprising both of:

carbon whose peak cannot be detected on its X-ray diffraction chart or whose peak is below its detection limit thereon; and

carbon whose peak can be detected thereon,

in a matrix made of aluminum nitride.

5. The carbon-containing aluminum nitride sintered body according to claim 4,

wherein:

said carbon whose peak cannot be detected on its X-ray diffraction chart or whose peak is below its detection limit thereon, is at least one of amorphous carbon, and carbon forming solid solution in the phase of aluminum nitride crystal; and

said carbon whose peak can be detected thereon is

crystalline carbon.

6. The carbon-containing aluminum nitride sintered body according to claim 4 or 5,
which comprises both of crystalline carbon and amorphous carbon.

7. The carbon-containing aluminum nitride sintered body according to any of claims 4 to 6,
which comprises said carbon in a total amount of 200 to 5000 ppm.

8. The carbon-containing aluminum nitride sintered body according to any of claims 1 to 7,
wherein said matrix contains a sintering aid comprising at least one of an alkali metal oxide, an alkali earth metal oxide, and a rare earth oxide.

9. The carbon-containing aluminum nitride sintered body according to any of claims 1 to 8,
wherein its brightness defined in JIS Z 8721 is N4 or less.

10. A ceramic substrate for a semiconductor-producing/examining device,
wherein: a ceramic substrate comprising carbon whose peak cannot be detected on its X-ray diffraction chart or whose peak is below its detection limit thereon, is provided with a conductor.

11. The ceramic substrate for the semiconductor-producing/examining device according to claim 10,
wherein: said carbon whose peak cannot be detected on its X-ray diffraction chart or whose peak is below its detection limit thereon, is at least one of amorphous carbon, and carbon

forming solid solution in the phase of ceramic crystal.

12. The ceramic substrate for the semiconductor-producing/examining device according to claim 10 or 11,

wherein the content of said carbon is from 200 to 5000 ppm.

13. A ceramic substrate for a semiconductor-producing/examining device,

wherein a ceramic substrate: comprising both of:

carbon whose peak cannot be detected on its X-ray diffraction chart or whose peak is below its detection limit thereon; and

carbon whose peak can be detected thereon,

is provided with a conductor.

14. The ceramic substrate for the semiconductor-producing/examining device according to claim 13,

wherein:

said carbon whose peak cannot be detected on its X-ray diffraction chart or whose peak is below its detection limit thereon, is at least one of amorphous carbon, and carbon forming solid solution in the phase of aluminum nitride crystal; and

said carbon whose peak can be detected thereon is crystalline carbon.

15. The ceramic substrate for the semiconductor-producing/examining device according to claim 13 or 14,

wherein the content of said carbon is from 200 to 5000 ppm.

16. The ceramic substrate for the

semiconductor-producing/examining device according to any of claims 9 to 15,

wherein said ceramic substrate contains a sintering aid comprising at least one of an alkali metal oxide, an alkali earth metal oxide, and a rare earth oxide.

17. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 9 to 16,

wherein its brightness defined in JIS Z 8721 is N4 or less.

18. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 9 to 17,

wherein:

said conductor is an electrostatic electrode; and

said ceramic substrate functions as an electrostatic chuck.

19. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 9 to 17,

wherein:

said conductor is a resistance heating element; and

said ceramic substrate functions as a hot plate.

20. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 9 to 17,

wherein:

said conductor is formed: on a surface of the ceramic substrate; and inside the ceramic substrate;

said inside conductor is at least one of a guard electrode and a ground electrode; and

said ceramic substrate functions as a wafer prober.

CLAIMS

1. A ceramic heater, wherein a resistance heating element is arranged on a surface of a disc-shaped ceramic substrate or inside the substrate,

characterized in that said resistance heating element is composed of a mixture of a resistance heating element having a concentric or spiral pattern and a resistance heating element having a pattern of a winding line.

2. A ceramic heater, wherein a resistance heating element is arranged on a surface of a disc-shaped ceramic substrate or inside the substrate,

characterized in that said resistance heating element is composed of a mixture of a resistance heating element having a concentric or spiral pattern and a resistance heating element having a pattern of repeated winding lines.

3. The ceramic heater according to claim 1 or 2, wherein the resistance heating element having the pattern of the winding line or the pattern of the repeated winding lines is formed at least in a peripheral portion of the disc-shaped ceramic substrate.

4. The ceramic heater according to any of claims 1 to 3, wherein said ceramic substrate is made of a non-oxide ceramic.

5. The ceramic heater according to any of claims 1 to 3, wherein said ceramic substrate is made of a nitride ceramic.

6. The ceramic heater according to any of claims 1 to 3, wherein said ceramic substrate is made of a carbide ceramic.

CLAIMS

1. A ceramic substrate for a semiconductor-producing/examining device having a conductor formed on a surface of the ceramic substrate or inside the ceramic substrate,

wherein:

said substrate is made of a non-oxide ceramic containing oxygen; and

the pore diameter of the maximum pore thereof is 50 μm or less.

2. The ceramic substrate for the semiconductor-producing/examining device according to claim 1,

wherein said non-oxide ceramic is a nitride ceramic.

3. The ceramic substrate for the semiconductor-producing/examining device according to claim 1,

wherein said non-oxide ceramic is a carbide ceramic.

4. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 1 to 3,

wherein said ceramic substrate contains oxygen in an amount of 0.05 to 10% by weight.

5. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 1 to 4,

wherein said ceramic substrate has a porosity of 5% or less.

6. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 1 to 5,

wherein said ceramic substrate is used within the temperature range of 100 to 700 °C.

7. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 1 to 6,

wherein said ceramic substrate has a thickness of 25 mm or less, and a diameter of 200 mm or more.

8. The ceramic substrate for the semiconductor-producing/examining device according to any of claims 1 to 7,

wherein said ceramic substrate has a plurality of through holes into which lifter pins for a semiconductor wafer will be inserted.

CLAIMS

1. A ceramic substrate comprising a conductor layer formed therein, characterized in that a section of the edge of the conductor layer is in a peaked shape.

2. The ceramic substrate according to claim 1, wherein the conductor layer is a resistance heating element and functions as a hot plate.

3. The ceramic substrate according to claim 1 or 2, wherein the conductor layer is an electrostatic electrode and functions as an electrostatic chuck.

4. The ceramic substrate according to any of claims 1 to 3, wherein the conductor layer has a portion in the peaked-shape having a width of 0.1 to 200 μm.

5. A process for producing a ceramic substrate, characterized by printing a conductor layer on a ceramic green sheet, integrating the green sheet with another green sheet under heating and pressure, and then sintering the ceramic powder.

Abstract

An object of the present invention is to provide a ceramic substrate that is superior in heat uniformity and thermal shock resistance, and has a large chuck power in the case that the ceramic substrate is made to be an electrostatic chuck. The ceramic substrate of the present invention is a ceramic substrate comprising a conductor layer formed therein, characterized in that a section of the edge of the conductor layer is in a peaked shape.